

REMARKS

In the Claims:

Claims 2, 4-20, and 22-31 remain in this application. Claims 2, 6-11, 22, and 26-27 have been amended. Claims 1, 3, and 21 have been canceled. New claims 29-31 have been added.

Rejections Under 35 U.S.C. 112:

The Examiner rejected claims 1 and 2 under 35 U.S.C. 112, second paragraph, as being indefinite. The Examiner states that a phrase, “sacrificial dielectric layer” recited in claim 1, is indefinite in light of the recitation of first and second layers in claim 2. The Examiner stated that it is unclear whether all of these are separate dielectric material layers or the same dielectric material layers. While Applicants have canceled claim 1, claim 2 now includes the limitations formerly recited in claim 1, so both of these rejections will be addressed below.

Applicants believe that this rejection may have been made in error based on a misreading of claim 1. Applicants point out that claim 1 does not recite the phrase, “sacrificial dielectric layer.” Rather, claim 1 simply recites that conductive vertical series are isolated from each other by “sacrificial dielectric material.” Thus, the Examiner’s statement that the claims are unclear about the distinction, or lack thereof, between the “layer” of claim 1 and the first and second layers of claim 2 is based upon language that is not present in the claims.

Further, the language used in claim 1, “sacrificial dielectric material,” is logically consistent with the recitation of first and second layers of sacrificial dielectric material in

claim 2. The language of claim 1 is general language that simply states that the type of material that isolates the conductive vertical series comprises sacrificial dielectric material. This material may include portions of the first and second layers of sacrificial dielectric material recited in claim 2.

Claim 2 depends from claim 1 and provides more specificity by reciting first and second layers of sacrificial dielectric material. Such first and second layers are clearly separate layers of sacrificial dielectric material, since they are so recited and the second layer is formed “adjacent the first layer.” Also, as stated above, they may make up part of the sacrificial dielectric material that isolates the conductive vertical series.

Rejections Under 35 U.S.C. 102(b):

Claims 1-12, 22, 23, and 25-28 were rejected under 35 U.S.C. 102(b) as being anticipated by Grill et al. (U.S. 6,413,852) (hereinafter “Grill”).

Grill fails to disclose, “forming a second layer of sacrificial dielectric material **adjacent the** at least two conductive layers and **first layer**,” (emphasis added) as recited in claim 2. The Examiner has characterized layers 110, 120, 130, 140 of Grill as the first layer of sacrificial material (Office Action, page 4, item 5) and dielectric layers 110’, 120’, 140’ of Grill as the second layer of sacrificial material (Office Action, page 4, item 5). However, the dielectric layers 110’, 120’, 140’ of Grill are not formed adjacent layers 110, 120, 130, 140. Rather, layers 110, 120, 130, and 140 of Grill are almost entirely removed prior to formation of layers 110’, 120’, 140’ (Grill, Figs. 1E, 1F, and 1J; col. 5, lines 54-58; col. 5, lines 45-65). The dielectric layers 110’, 120’, 140’ of Grill are instead formed adjacent sacrificial placeholder material 220, and not adjacent the first layer of sacrificial material as recited in claim 2.

Applicant pointed this out in the previous response. The Examiner did not address this remark because the Examiner stated that the claim language is indefinite (Office Action, page 8, paragraph 20). However, as shown above, the claim language is not indefinite, and both rejections (under 35 U.S.C. 112 and 35 U.S.C. 102) should be withdrawn.

Applicants note that claim 2 has also been amended into independent form, to include all limitations previously present in claim 1. Only the form of claim 2 has changed. Its substance and meaning remains the same.

Claims 4, 5, and 12-20 depend from claim 2. Applicant thus requests that the Examiner withdraw the rejections of claims 4, 5, and 12-20 for the reasons provided above.

Grill fails to disclose that, “none of the peripheral vertical support structures are between the at least two conductive vertical series,” as recited in amended claim 22. The Examiner cites col. 7, lines 26-28 of Grill as disclosing vertical support structures (Office Action, page 6, item 14). Col. 7, lines 26-28 of Grill states that SPH may be left in the structure to support the bridge layer 260, but does not state the location of such remaining SPH, much less that none of this remaining SPH is between the at least two conductive vertical series. Thus, Grill fails to disclose the location of the peripheral vertical support structures as recited in claim 22. The rejection should be withdrawn.

Claims 23-25 depend from claim 22. Applicant thus requests that the Examiner withdraw the rejections of claims 23-25 for the reasons provided above.

Grill fails to disclose that, “no peripheral vertical support structure is between the first and second conductive vertical series,” as recited in claim 28. The Examiner has characterized reference number 210 of Grill as the peripheral vertical support structure (Office Action, page 7, item 18). However, reference number 210 of Grill is found between the conductive vertical series of Grill, on both sides of the conductive vertical series

(admitted by the Examiner in the Office Action, page 7, line 18; also shown in Fig. 3A of Grill). Nowhere does Grill disclose a structure that includes dielectric sidewall spacers 210 without such spacers being between vertical conductors. Therefore, Grill does not disclose that, “no peripheral vertical support structure is between the first and second conductive vertical series,” as recited in claim 28. The rejection should be withdrawn.

New claim 29 has been added. This claim recites forming a first layer of sacrificial dielectric material in which trenches are formed to allow formation of conductive layers. The claim recites forming a second layer of sacrificial dielectric material adjacent remaining portions of a first layer of sacrificial dielectric material in which trenches are formed to allow formation of conductive layers. Trenches are also formed in the second layer to form additional conductive layers. These sacrificial layers are removed to form air gaps between the conductive layers.

In Grill, trenches are formed within layers 110, 120, 130, 140 to form conductive layers. However, the dielectric layers 110', 120', 140' of Grill, in which more trenches are formed to form a second level of conductive layers, are not formed adjacent layers 110, 120, 130, 140. Rather, layers 110, 120, 130, and 140 of Grill are almost entirely removed prior to formation of layers 110', 120', 140' (Grill, Figs. 1E, 1F, and 1J; col. 5, lines 54-58; col. 5, lines 45-65). Thus, the dielectric layers 110', 120', 140' of Grill are formed adjacent sacrificial placeholder material 220, and not adjacent the first layer of sacrificial material as recited in claim 29. Thus, Grill fails to disclose every element of claim 29.

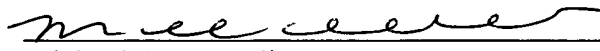
Claims 6-11, and 26-27 have been amended to depend from claim 29 rather than claim 1. Applicant thus requests that the Examiner withdraw the rejections of claims 6-11, and 26-27 for the reasons provided above.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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